

**DETAILED ACTION**

***Response to Amendment***

1. Applicant's amendment, filed January 4, 2010, has been entered and carefully considered. Claims 1-12 are canceled and Claims 13-24 are newly added and currently pending.

**EXAMINER'S AMENDMENT**

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Josephine Chang (Reg. No. 46,083) on March 24, 2010.

The application has been amended as follows:

**In the claims:**

13. (Currently Amended) A device for shared management of a resource between several users, comprising:

a memory for storing virtual deadlines ( $E_i$ ) and share parameters ( $D_i$ ) associated with respective user-identifiers ( $u_i$ ), each of the user-identifiers ( $u_i$ ) representing one of the users, the memory further storing values of increments ( $P(c)$ );

a plurality of classes, each class being associated with a respective one of the values of increments ( $P(c)$ ) stored in the memory;

a plurality of first-in-first-out (FIFO) queues for storing the user-identifiers ( $u_i$ ) of the users, each FIFO being assigned to one of the plurality of classes and being associated with one of the values of increments ( $P(c)$ ) of one of the plurality of classes; and

a processing unit coupled to the memory and the FIFO queues, wherein the processing unit is configured to:

select a user-identifier ( $u_s$ ) of one of the FIFO queues, the selected user-identifier ( $u_s$ ) being at the head of the one of the FIFO queues and having the least advanced virtual deadline ( $E_s$ ) among the stored virtual deadlines;

allocate to the user represented by the selected user-identifier ( $u_s$ ) a service slice ( $Q_s$ ) of the resource, the service slice ( $Q_s$ ) being derived from the values of the share parameters ( $D_s$ ) associated with the selected user-identifier ( $u_s$ ) and of the increment ( $P(c)$ ) of the FIFO in which the selected-identifier ( $u_s$ ) is stored; and

increase the virtual deadline ( $E_s$ ) associated with the selected user-identifier ( $u_s$ ) according to a value of increment ( $dE_s$ ), wherein the service slice ( $Q_s$ ) allocated to the user represented by the selected user-identifier ( $u_s$ ) results from a formula  $Q_s = P(c) \times D_s$ .

14. (Canceled)

15. (Currently amended) The device according to one of the claims 13 and 14, wherein the processing unit is further configured to:  
~~store in the memory~~ maintain a virtual point in time ( $V$ ) managed by the device;

increase the virtual point in time ( $V$ ) by an increment value ( $pV$ ) for advancing the virtual point in time ( $V$ ); and

allow allocation of the service slice ( $Q_s$ ) to the user represented by the selected user-identifier ( $u_s$ ) as long as the virtual deadline ( $E_s$ ) associated to the selected user-identifier ( $u_s$ ) is less advanced than the virtual point in time ( $V$ ).

16. (Currently amended) The device according to claim 15, wherein the virtual point in time ( $V$ ) is increased by the increment value ( $pV$ ) for each allocation to the user represented by the selected user-identifier ( $u_s$ ) of the service slice ( $Q_s$ ) of the resource, the increment value ( $pV$ ) being a quotient of the increment ( $P(c)$ ) of the FIFO queue in which the selected-identifier ( $u_s$ ) is stored and a sum ( $D$ ) of the share parameters  $D_i$  ( $D_i$ ).

17. (Currently amended) The device according to claim 13, wherein the memory comprises:

a FIFO queues area storing, for each of the FIFO queues, one of the values of the increments ( $P(c)$ ) and the user-identifier ( $u_s$ ) of the user at the head of the FIFO queue; and

a users area storing, for each user, the user-identifiers ( $u_i$ ), the share parameters ( $D_i$ ), and an end of queue item ( $nd(u)$ ).

18. (Currently amended) The device according to claim 17, wherein FIFO queues are cyclic queues defining circular lists, and wherein each of the FIFO queues associates

a single virtual deadline  $(F(c))$  to the user-identifiers  $(u_i)$  stored in the FIFO queue, said single virtual deadline  $(F(c))$  being stored in the FIFO queues area.

19. (Currently amended) The device according to claim 18, wherein the processing unit is further configured to:

allocate to the user represented by the selected user-identifier  $(u_s)$  the service slice  $(Q_s)$  of the resource, the selected user-identifier  $(u_s)$  being in the list having the least advanced virtual deadline  $(F(c))$ ; and

increase the virtual deadline  $(F(c))$  of said list after allocating a service slice  $(Q_i)$  to a user at the end of said list.

20. (Currently amended) The device according to claim 13, wherein users requesting a service slice of the resource are ~~discriminated~~distinguished from users not requesting a service slice of the resource.

22. (Currently amended) The device according to claim 21, wherein a virtual deadline  $(F(u))$  is assigned to the user-identifiers  $(u_i)$  of a newly requesting user, the virtual deadline  $(F(u))$  being dependent on ~~the~~a virtual point in time  $(V)$  managed by the device.

24. (Currently amended) The device according to claim 23, wherein a non-requesting user is eliminated when said non-requesting user is allowed to use a resource and possesses the least advanced virtual deadline  $(F(u))$  among the stored virtual deadlines.

***Allowable Subject Matter***

3. **Claims 13 and 15-24** are allowed. The following is an examiner's statement of reasons for allowance: Marin et al (United States Patent 6,088,734) discloses a plurality of FIFO queues assigned to priorities and having an associated increment value (Figures 7 and 8; column 9, line 16-column 10, line 20; column 11, lines 14-51). Further, Marin discloses selecting a cell from one of the priority-associated queues based on an initial timestamp associated with the cell (column 12, lines 12-30). Whitehead (United States Patent 6,295,285) discloses a quality-of-service manager that follows a FIFO policy serving jobs in order of arrival and an earliest-deadline policy serving job in order of "deadline times" attached to each job (column 14, lines 51-59). McDonald et al (United States Patent 6,442,166) discloses an earliest-deadline-first service, comprising a queuing module and relative lateness estimator (see Figure 1). However, the prior art of record does not disclose or suggest allocating to the user represented by the selected user-identifier ( $u_s$ ) a service slice ( $Q_s$ ) of the resource, the service slice ( $Q_s$ ) being derived from the values of the share parameters ( $D_s$ ) associated with the selected user-identifier ( $u_s$ ) and of the increment ( $P(c)$ ) of the FIFO in which the selected-identifier ( $u_s$ ) is stored; and increase the virtual deadline ( $E_s$ ) associated with the selected user-identifier ( $u_s$ ) according to a value of increment ( $dE_s$ ), wherein the service slice ( $Q_s$ ) allocated to the user represented by the selected user-identifier ( $u_s$ ) results from a formula  $Q_s = P(c) \times D_s$ .

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue

fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Chriss whose telephone number is (571)272-1774. The examiner can normally be reached on Monday - Friday, 7:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Trost can be reached on 571-272-7872. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Andrew Chriss  
Examiner  
Art Unit 2472  
3/24/2010

/William Trost/  
Supervisory Patent Examiner, Art Unit  
2472

/A. C./  
Examiner, Art Unit 2472